Australian Bureau of Statistics

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Summary

Estimating firm contributions to aggregate productivity'

Approaches to estimate the firm contributions to aggregate productivity

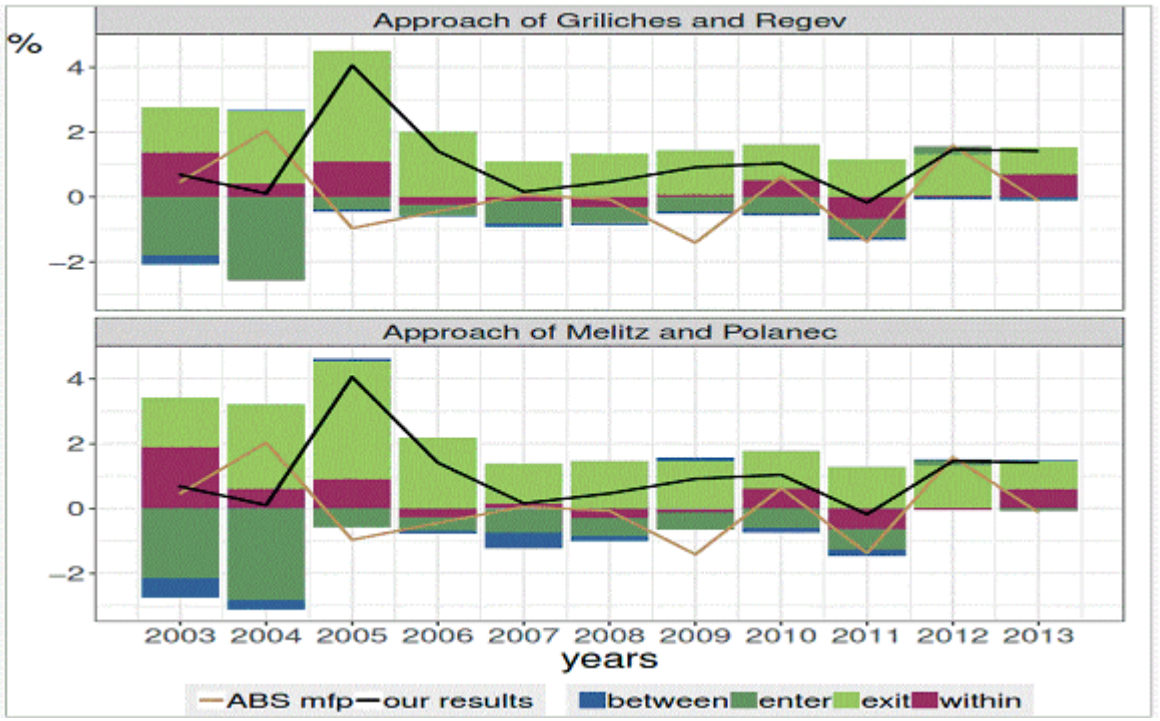
This research estimates the contribution to productivity growth in Australia in the period 2002 – 2013 of:

- firm entry and exit
- firms within industries and
- firms between industries.

We compare two different decomposition approaches to estimate the firm contributions to aggregate productivity. We find that firm entry and exit are by far the largest contributors to productivity growth across all industries.

Chart 1 shows that, in general, firm exit contributes positively to productivity growth, whereas firm entry contributes negatively. The two approaches provide similar results but the approach of Melitz and Polanec (2015) uses appropriate benchmarks for calculating the contributions from the entering and exiting firms.

Chart 1 Comparison of decomposition approaches



Instrumental variable, preconditioned conjugate gradient and grouping algorithms

This research applies an instrumental variable regression to reduce the bias in estimating firm productivity. We derive the instrumental variable from an experimental linked dataset of 10 million workers across 1.5 million firms. It is not feasible to perform calculations on a matrix with 130 million rows and 11.5 million columns. Therefore, we use a preconditioned conjugate gradient algorithm to solve a large sparse matrix and a grouping algorithm to identify unique solutions.

About this Release

This Research Paper discusses estimation methods to handle high dimensionality and compare different decomposition approaches for productivity analysis.

HIstory of Changes

30/10/2020

Updated data section to improve explanations and fixed estimation results after incorporating reviewers' comments. Main changes include:

- providing more information on the data section in particular showing missing data and impact of data imputation.
- updating estimation approach and statistical model in section 6.3.
- updating the empirical results section with more detailed descriptions
- adding imputation method in Appendix B.
- updating industry decomposition results in Appendix C
- updating firm model results in Appendix D.